

SECTION TABLE OF CONTENTS

SITE WORK

SECTION 02147

DRAINAGE COMPOSITES

PART 1 GENERAL

- 1.1 SUMMARY (Not Applicable)
- 1.2 REFERENCES
- 1.3 SUBMITTALS
- 1.4 DELIVERY, STORAGE, AND HANDLING OF MATERIALS
 - 1.4.1 Delivery and Storage
 - 1.4.2 Handling

PART 2 PRODUCTS

- 2.1 DRAINAGE COMPOSITES
 - 2.1.1 Geotextiles
 - 2.1.2 Drainage Core
- 2.2 OUTLET PIPE

PART 3 EXECUTION

- 3.1 INSTALLATION OF DRAINAGE COMPOSITES
- 3.2 CONTRACTOR'S RESPONSIBILITY

.- End of Table of Contents

SECTION 02147

DRAINAGE COMPOSITES

PART 1 GENERAL

1.1 SUMMARY (Not Applicable)

2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 1621	(1979) Compressive Properties of Rigid Cellular Plastics
ASTM D 3786	(1987) Hydraulic Bursting Strength of Knitted Goods and Non-Woven Fabrics
ASTM D 4355	(1984) Deterioration of Geotextiles from Exposure to Ultraviolet Light and Water (Xenon-Arc Type Apparatus)
ASTM D 4533	(1985) Trapezoidal Tearing Strength of Geotextiles
ASTM D 4632	(1986) Breaking Load and Elongation of Geotextiles (Grab Method)
ASTM D 4833	(1988) Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products
ASTM D 4716	(1987) Constant Head Hydraulic Transmissivity (In-Plane Flow) of Geotextiles and Geotextile Related Products
ASTM D 4751	(1987) Determining the Apparent Opening Size of a Geotextile

1.3 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with SECTION 01300 SUBMITTALS:

SD-09 Reports

Test Reports; FIO.

Certified copies of laboratory test reports attesting that the drainage composite conforms to the standard specified herein. These tests shall be made by an approved commercial laboratory or by a laboratory maintained by the manufacturers of the materials and shall be submitted at least 30 days prior to commencement of work, and shall be approved prior to use on the project.

1.4 DELIVERY, STORAGE, AND HANDLING OF MATERIALS

1.4.1 Delivery and Storage

Materials delivered to site shall be inspected for damage, unloaded and stored with the minimum of handling. Materials shall not be stored directly on the ground. During shipment and storage, drainage composites shall be wrapped in a heavy-duty protective covering. The storage area shall be such that the composite is protected from mud, soil, dust, debris, and temperatures greater than 140 degrees F.

1.4.2 Handling

Drainage composites shall be handled in such a manner as to insure delivery to area of placement in sound, undamaged condition.

2 PRODUCTS

DRAINAGE COMPOSITES

The drainage composite shall consist of a geotextile and a drainage core meeting the requirements specified below. The geotextile and drainage core may be separate materials or a composite of the two materials bonded together during manufacture. If used on the steel arch, the composite shall be flexible enough to conform to the steel corrugations.

2.1.1 Geotextiles

Geotextiles shall be non-woven pervious sheet of long chain polymeric filaments of polypropylene or polyester, formed by needle punching into a pattern with distinct and measurable openings. The geotextile shall provide an Apparent Opening Size (AOS) no finer than the US Standard Sieve No. [_____] and no coarser than the US Standard Sieve No. [_____] per ASTM D 4751. The fabric shall conform to the physical strength requirements in Table I. The edges of the fabric shall be selvaged or otherwise finished, as required, to prevent the outer material from pulling away from the fabric .

2.1.2 Drainage Core

The drainage core shall be nylon, polyethylene or other high-strength plastic of adequate size to carry groundwater from the geotextile to the drainage outlet and of adequate strength to prevent crushing during installation or by lateral earth pressures during in-service use. The core configuration shall provide multi-directional water flow. The core shall have the following minimum compressive strength and flow rate: 40 psi (5760 psf) per ASTM D 1621, maximum deflection 10 percent. 10 gal/min/ft at 2000 psf and gradient of 1.0 per ASTM D 4716 (in a soil

environment)

TABLE I. Physical Strength Requirements

<u>Physical Property</u>	<u>Test Procedure</u>	<u>Acceptable Test Results</u>
Tensile Strength (unaged fabric)*	ASTM D 4632	80 pounds per inch minimum in any principle direction
Puncture Strength (unaged fabric)*	ASTM D 4833	25 pounds minimum
Elongation at Failure (unaged fabric)*	ASTM D 4632	60 percent minimum
Burst Strength	ASTM D 3786	130 pounds minimum
Trapezoidal Tear Strength (unaged fabric)*	ASTM D 4533	40 pounds minimum
Resistance to Ultraviolet Light (% Retained Strength)	ASTM D 4355	70 @ 150 hours

*NOTE 1: Unaged fabric is defined as fabric in the condition as received from the Manufacturer or Distributor.

2.2 OUTLET PIPE

Outlet pipe shall conform to the requirements of Section 02711 FOUNDATION DRAINAGE SYSTEM.

PART 3 EXECUTION

3.1 INSTALLATION OF DRAINAGE COMPOSITES

The drainage composite shall be placed against the structure after the elastomeric membrane waterproofing has been applied. The composite shall be laid smooth and free of tension, stress, wrinkles, folds, or creases. Drainage core material shall be cut back at the edges where the composite is terminated so that sufficient geotextile material is left to overlap and join to structures or wrap around drain pipes. Care shall be taken during installation to prevent damage to the drainage composite, waterproofing, or the structure.

3.2 CONTRACTOR'S RESPONSIBILITY

Any drainage composite with defects, rips, holes, flaws, deterioration, or damage incurred during manufacture, transportation, storage, handling, installation, or backfilling will be rejected by the Contracting Officer and will be replaced or repaired by the Contractor, as directed, at no additional cost to the Government.

End of Section